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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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FOLEY HOAG, LLP PATENT GROUP, WORLD TRADE CENTER WEST 155 SEAPORT BLVD BOSTON, MA 02110			LEE, SHUN K	
			ART UNIT	PAPER NUMBER
			2884	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,148

Applicant(s)

ELSTEIN ET AL.

Examiner

Shun Lee

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6, 8-51, 53-57 and 59 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-4, 6, 8-51, 53-57 and 59 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 27 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

2. Claims 16 and 18 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Amended independent claim 8 recites the limitation "SBUV image providing means comprising a photocathode for receiving the optical radiation in the UV spectral range only, passed through said solar blind ultraviolet optical filter". However, claim 16 recites the limitation "the SBUV image sensor contains a fluorescent screen" which fails to further limit the subject matter of a previous claim. In addition, claim 16 recites the limitation "the SBUV image sensor is selected from among a group of sensors consisting of CCD, BCCD, EBCCD, ICCD, MCP-PMT having multianode, and MCP-PMT having position sensitive anode output" which fails to further limit the subject matter of a previous claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2884

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 3, 6, 8-18, 20, 22, 35, 38-43, 46, 47, 54-56, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey (US 5,841,574) in view of Dirscherl *et al.* (US 5,001,348).

In regard to claims **35** and **54-56**, Willey discloses (Fig. 4) a method of detecting, locating, and visualizing emittance of UV sources and emittance of IR scenery in a common scene suspected of containing a source of UV emittance comprising:

- (a) simultaneously imaging through a same aperture (central aperture A) and in a common optical axis the scene and its IR background scenery with two separate imaging units (detector 1 and detector 2), a first UV imaging unit (detector 1) imaging in the SBUV spectral band (*i.e.*, a frequency band of interest from 200 nm to 2900 nm; column 8, lines 25-29) for forming and displaying an image of said UV

- emission, and a second IR imaging unit (detector 2) for visually forming and displaying an image of the IR scenery (column 8, lines 29-33);
- (b) a first element (field optics 1) providing the first image of the scene into the first UV imaging unit (detector 1) wherein the first UV imaging unit (detector 1) is located at an image plane of the first element (field optics 1) and a second element (field optics 2) providing the second image of the scene into the second IR imaging unit (detector 2); and
- (c) combining the images as obtained by said simultaneous imaging in a common optical axis, by overlaying the image formed by said SBUV imaging unit over the image formed by said IR imaging unit, thereby forming one combined and exactly registered visual image showing the UV emittance and the IR emittance in their exact positions within the scenery with no parallax (*i.e.*, sensor fusion; column 6, lines 11-19).

While Willey also discloses (column 17, lines 51-65) that components can be selected depending on the frequency bands of interest, the method of Willey lacks an explicit description that the first UV imaging unit is an UV solar blind image intensifier comprising a solar blind filter and an UV photocathode. However, UV imaging units are well known in the art. For example, Dirscherl *et al.* teach (column 5, line 60 to column 6, line 59) to provide an UV solar blind image intensifier comprising a photocathode of an UV image intensifier in combination with suitable filters, in order to detect the self- or characteristic-emission of a flying body exhaust gas stream in the ultraviolet spectral range with sensor devices which are blind to artificial and solar UV (column 2, lines 17-

26). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a known UV imaging unit as the UV imaging unit in the method of Willey such as an UV photocathode in combination with a suitable solar blind filter, in order to detect the self- or characteristic-emission of a flying body exhaust gas stream in the ultraviolet spectral range with sensor devices which are blind to artificial and solar UV.

In regard to claims **1, 6, 8-15, 16** (which is dependent on claim 15 in so far as understood), **17, 18** (which is dependent on claim 15 in so far as understood), **20, 38-43, 46, 47, and 59**, Willey in view of Dirscherl *et al.* is applied as in claims 35 and 54-56 above. Willey also discloses (Fig. 4) that the image acquiring means comprises a dichroic beamsplitter (S) receiving optical beams from the scene along said common optical axis and splitting the received optical beams. While Willey further discloses (column 17, lines 51-65) that the frequency bands of interest can include a third portion of the spectrum, the apparatus and method of Willey lacks an explicit description that one of the optical beams split by a dichroic beamsplitter is in the visible portion of the spectrum and is directed towards a visible imaging unit comprising an image sensor selected from among a group of sensors consisting of CCD, CMOS, and CID, receiving the visible image, and producing second electronic signals describing said image. Dirscherl *et al.* teach (column 11, lines 1-45) to detect multiple spectral ranges such as UV, VIS, and IR using an imaging unit comprising a CCD, in order to unambiguously locate and recognize an object. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a visible imaging unit (e.g.,

an imaging unit comprising a CCD) for detecting a visible portion of the spectrum in the apparatus and method of Willey, in order to unambiguously locate and recognize an object.

In regard to claim 3 (which is dependent on claim 1) and claim 22 (which is dependent on claim 8), the apparatus and method of Willey lacks an explicit description of transferring the combined visual image into electronic recording and/or displaying means for recording and/or displaying the combined visual image. However, electronic recording and/or displaying means for cameras are well known in the art. For example, Dirscherl *et al.* teach (column 11, lines 1-66) to transfer a combined visual image into electronic recording and/or displaying means such as a video monitor for recording and/or displaying the combined visual image. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to transfer the combined visual image into electronic recording and/or displaying means in the apparatus and method of Willey, in order to record and/or display the combined visual image.

6. Claims 2, 19, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey (US 5,841,574) in view of Dirscherl *et al.* (US 5,001,348) as applied to claims 1 and 8 above, and further in view of Filopovich (US 5,079,416).

In regard to claim 2 which is dependent on claim 1, the modified method of Willey lacks an explicit description that the combining of said first and second images is carried out by optical combining means, allowing viewing of the combined visual image. However, optical elements such as beam combiners or splitters (*e.g.*, dichroic beamsplitters) are well known in the art. For example, Filopovich teaches (column 5,

lines 3-12) that dichroic beamsplitters combine or split beams. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a well known optical element such as a dichroic beamsplitter in the modified method of Willey, in order to combine or split beams using well known optical principles so as to obtain a combined visual image (e.g., superimposed first and second visible images in a vision aid application).

In regard to claim **19** which is dependent on claim 8, the modified apparatus of Willey lacks an explicit description that the combining of the first visible image of the solar blind UV range of the scene and the second visible image is carried out by a beamsplitter simultaneously receiving said first and second visible images. However, optical elements such as beam combiners or splitters (e.g., dichroic beamsplitters) are well known in the art. For example, Filopovich teaches (column 5, lines 3-12) that dichroic beamsplitters combine or split beams. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a well known optical element such as a dichroic beamsplitter in the modified apparatus of Willey, in order to combine or split beams using well known optical principles so as to obtain a combined visual image (e.g., superimposed first and second visible images in a vision aid application).

In regard to claim **24** which is dependent on claim 8, the modified apparatus of Willey lacks an explicit description that the visible imaging unit comprises only passive optical elements and the SBUV imaging unit comprises passive optical elements. However, passive optical elements such as beam combiners or splitters (e.g., dichroic

beamsplitters) are well known in the art. For example, Filopovich teaches (column 5, lines 3-12) that dichroic beamsplitters combine or split beams. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a well known optical element such as a dichroic beamsplitter in the modified apparatus of Willey, in order to combine or split beams using well known optical principles so as to obtain a combined visual image (e.g., superimposed first and second visible images in a vision aid application).

7. Claims 4, 21, 23, 28-34, 36, 37, 48-51, 53, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey (US 5,841,574) in view of Dirscherl *et al.* (US 5,001,348) as applied to claims 3, 8, 22, and 35 above, and further in view of Applicant's Admitted Prior Art.

In regard to claim **4** (which is dependent on claim 3) and claim **23** (which is dependent on claim 22), the modified apparatus and method of Willey lacks that the electronic recording and/or displaying means is a videotape. However, videotapes are well known in the art. For example, applicant admits (last paragraph on pg. 34 and third paragraph on pg. 39) as Prior Art that standard video equipment such as videotapes are well known in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide well known videotapes in the modified apparatus and method of Willey, in order to obtain a record of the combined visual image.

In regard to claim **21** which is dependent on claim 8, the modified apparatus of Willey lacks that the combined visual image is obtained by at least one of arithmetic

mixing, non-arithmetic mixing, luminance keying and chroma keying, for combining first and second electronic signals representing the first and second visible images, respectively. However, a combined visual image obtained by arithmetic mixing, non-arithmetic mixing, luminance keying or chroma keying is well known in the art. For example, applicant admits (last two paragraphs on pg. 23) as Prior Art that a combined visual image obtained by arithmetic mixing, non-arithmetic mixing, luminance keying or chroma keying is well known in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide well known means of arithmetic mixing, non-arithmetic mixing, luminance keying or chroma keying in the modified apparatus of Willey, in order to obtain a combined visual image.

In regard to claims **28** and **29** which are dependent on claim 21, the modified apparatus of Willey lacks an explicit description of a digital processing unit for processing at least one of the first and second electronic signals, for at least one of improving the contrast between the image of the UV emittance and the background scenery in the combined visual image, for the elimination of noise, the identification of UV emitters in the scene, and the capture of transient UV events in the scene. Dirscherl *et al.* teach (column 5, lines 20-27) a digital processing unit for processing at least one of the first and second electronic signals, for at least one of improving the contrast between the image of the UV emittance and the background scenery in the combined visual image, for the elimination of noise, the identification of UV emitters in the scene, and the capture of transient UV events in the scene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide

Art Unit: 2884

a digital processing unit in the modified apparatus of Willey, in order to improve the contrast between the image of the UV emittance and the background scenery in the combined visual image, to eliminate noise, to identify UV emitters in the scene, and/or to capture transient UV events in the scene.

In regard to claim **30** which is dependent on claim 28, the modified apparatus of Willey lacks that the processing unit is an analog processing unit. However, image processing units are well known in the art. For example, applicant admits (last two paragraphs on pg. 23) as Prior Art that analog processing units for image processing are well known in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide well known image processing means (e.g., analog processing units) in the modified apparatus of Willey, in order to process a combined visual image.

In regard to claims **31-34** which are dependent on claim 28, the modified apparatus of Willey lacks means for providing an alarm or means for initiating action (e.g., initiation of fire extinguishing means or documentation of UV emitting events) as to the detection of SBUV emittance which is above a predefined threshold level. However, means for providing an alarm or initiating action are well known in the art. For example, applicant admits (last paragraph on pg. 28) as Prior Art that means for providing an alert or initiating action are well known in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide well known means providing an alarm or initiating action in the modified apparatus of Willey, in order to indicate or initiate corrective measures.

In regard to claim **36** (which is dependent on claim 1), claim **37** (which is dependent on claim 8), and claim **53** (which is dependent on claim 35), while Willey also discloses (column 5, lines 12-16) that the apparatus is for multi-spectral imaging, the modified apparatus and method of Willey lacks an explicit description that it is used for imaging UV emittance caused by electrical discharge. However, UV emitting phenomena such as caused by electrical discharges are well known in the art. For example, applicant admits (last paragraph on pg. 4) as Prior Art that it is well known in the art to obtain images of electrical discharges for the early detection of electrical leakages. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use the modified apparatus and method of Willey for multi-spectral imaging of electrical discharges, in order to detect electrical leakages.

In regard to claims **48** and **50** (which are dependent on claim 1), claims **49** and **51** (which are dependent on claim 8), and claim **57** (which is dependent on claim 35), while Willey also discloses (column 5, lines 12-16) that the apparatus is for multi-spectral imaging, the modified apparatus and method of Willey lacks an explicit description that it is used for imaging of the reflections from objects (e.g., finger prints or fluid stains) illuminated by UV light sources. However, imaging of the reflections from objects (e.g., finger prints or fluid stains) illuminated by UV light sources is well known in the art. For example, applicant admits (first paragraph on pg. 6) as Prior Art that it is well known in the art to obtain images of the reflections from objects (e.g., finger prints or fluid stains which are invisible to the naked eye) illuminated by UV light sources. Therefore it would have been obvious to one having ordinary skill in the art at the time

of the invention to use the modified apparatus and method of Willey for multi-spectral imaging of UV illuminated objects, in order to detect objects (e.g., finger prints or fluid stains) which are invisible to the naked eye.

8. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey (US 5,841,574) in view of Dirscherl *et al.* (US 5,001,348) and Filopovich (US 5,079,416) as applied to claim 24 above, and further in view of Baril *et al.* (US 5,535,053).

In regard to claims **25** and **26** which are dependent on claim 24, the modified apparatus of Willey lacks that the modified apparatus in a monocular or binocular form. Baril *et al.* teach (column 1, lines 16-65) to provide a monocular or binocular display, wherein each display type have advantages for different applications. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a monocular or binocular display in the modified apparatus of Willey, in order to obtain a display adapted for a desired application.

9. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Willey (US 5,841,574) in view of Dirscherl *et al.* (US 5,001,348) as applied to claim 8 above, and further in view of Palmer (US 5,687,034).

In regard to claim **27** which is dependent on claim 8, the modified apparatus of Willey lacks a stills camera means for recording the combined visual image on a stills camera film. Palmer teaches (column 1, lines 13-63) to take photographs via an image converter. Therefore it would have been obvious to one having ordinary skill in the art

Art Unit: 2884

at the time of the invention to provide a camera means in the modified apparatus of Willey, in order to obtain photographs of the combined visual image.

10. Claims 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willey (US 5,841,574) in view of Dirscherl *et al.* (US 5,001,348) as applied to claims 42 and 43 above, and further in view of Hartemann *et al.* (US 4,835,391).

In regard to claim **44** (which is dependent on claim 42) and claim **45** (which is dependent on claim 43), while Willey also discloses (column 5, lines 12-16) that the apparatus is for multi-spectral imaging, the modified apparatus and method of Willey lacks an explicit description that it is used for imaging Cherenkov radiation. However, UV emitting phenomena such as Cherenkov radiation are well known in the art. For example, Hartemann *et al.* teach (column 1, lines 11-59) it is well known in the art to obtain images of Cherenkov radiation for the study of beam dynamics. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use the modified apparatus and method of Willey for multi-spectral imaging of Cherenkov radiation, in order to study beam dynamics.

Response to Amendment

11. The declaration under 37 CFR 1.132 filed 18 August 2005 is insufficient to overcome the rejection of claims based upon Dirscherl *et al.* (US 5,001,348) in view of Norris (US 5,719,567) under 35 U.S.C. 103(a) as set forth in the last Office action because: it refer(s) only to the system described in the above referenced application and not to the individual claims of the application. Thus, there is no showing that the

objective evidence of nonobviousness is commensurate in scope with the claims. See MPEP § 716.

Response to Arguments

12. Applicant's arguments with respect to the amended claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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